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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Paper No. 24

Application Number: 09/140,862

Filing Date: 8/27/1998

Appellant(s): Albert et al.

Michael J. Bastian

For Appellant

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EXAMINER'S ANSWER

This is in response to the appeal brief filed 6/4/2002.

(1) *Real Party in Interest*

A statement identifying the real party in interest is contained in the brief.

(2) *Related Appeals and Interferences*

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

(3) *Status of Claims*

The statement of the status of the claims contained in the brief is correct.

(4) *Status of Amendments After Final*

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

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(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

Appellant's brief includes a statement that claims 1-9 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

3,756,693	OTA	9-1973
5650872	SAXE ET AL.	7-1997
JP SHOWA 64-86116	NAOYUKI ET AL.	3-1989

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(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

OTA Reference: OTA teaches of an electrophoretic display comprising at least one capsule containing a suspending fluid and at least a first particle and a second particle, said first particle having a first optical property and a first electrophoretic mobility and said second particle having a second particle having a second optical property and a second electrophoretic mobility, column 4 lines 54-67; and at least two electrodes disposed adjacent said capsule, figure 3 item 8 and 9; wherein application of an electric field to said capsule by said electrodes causes said capsule to change visual state responsive to the optical properties and electrophoretic mobilities of said particles, wherein said first electrophoretic mobility and said second electrophoretic mobility are substantially non-overlapping, figure 3, column 4 lines 54-67. Wherein materials 16 and 17 are different from each other with respect to charge polarity and optical color, where they move in directions opposite each other given an applied voltage across the display electrodes, and therefore have substantially different mobilities due to their differing polarity and movement. Viewing OTA in the broadest interpretation of its teaching, it can be seen the OTA includes all the limitations found in claims 1, 2, and 6. As mentioned in the Non-Final Rejection filed on 12/4/2001, this assumes the capsule containing suspending fluid and particles is formed by the electrodes that encapsulate the display, forming one capsule for the entire display. Encapsulation is inherent to the structure of the display system having electrophoretic particles in a display suspension medium encapsulated by electrodes 8 and 9, or

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substrates 4 and 5. With this valid interpretation there is no need for any secondary references to reject the claims 1, 2, and 6. The display particles and suspending medium are encapsulated by/within the display system, as commonly termed in the art. However in the Non-Final rejection filed on 12/4/2001, the Examiner took a more narrowed interpretation of OTA in light of the Appellants specification, and cited that it was silent as to the particles being within a capsule. And therefore the multiple particle type electrophoretic displays as taught by SAXE et al. and NAOYUKI et al. where used to overcome the missing elements from OTA, the capsuled electrophoretic particles.

NAOYUKI ET AL. Reference: As shown in the English translation of NAOYUKI, NAOYUKI et al. teaches of all of the limitations of claim 6, with the exception of being silent on the distinction of the a first and second particles, with a first and second mobilities, as found in claims 1 and 2. As shown in paragraph 4 of the translation, NAOYUKI teaches the “electrophoretic particles 4 are dispersed in a dispersion medium, are placed between the transparent electrodes 2 formed on the opposing surfaces of a pair of transparent sheets” and further “in addition to well-known colloidal particles, various other organic or inorganic pigments, dyes, metal powders, glass, resin or other fine powders, as appropriate.” can be used. Therefore NAOYUKI teaches of all the limitations of claim 6, with the exception of being silent on the first and second particles with a first and second mobilities, as found in claims 1 and 2. The Examiner interprets NAOYUKI to suggest more than one type of particle can be used in the invention, in addition to the well known colloidal particles.

Motivation Suggestion in NAOYUKI ET AL.: NAOYUKI ET AL. teaches that display systems of the type taught by OTA can suffer from coagulation of the electrophoretic particles or

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adhesion/sticking to the electrodes. To overcome this problem, NAOYUKI ET AL teaches encapsulating the particles can help eliminate this problem, and a uniform and stable display operation can be the result. This is the Examiners motivation for suggesting that the electrophoretic display of OTA with a first and second particle of a first and second electrophoretic mobility can be encapsulated as suggested by NAOYUKI ET AL.. NAOYUKI ET AL. solves a problem known to exist in the display as taught by OTA, therefore it would be obvious to the skilled artisan to take advantage of this improvement well known in the art. The SAXE ET AL. reference was used by the Examiner to further support the well known need to encapsulate as suggested by NAOYUKI ET AL., the system as taught by OTA, wherein SAXE ET AL. also suggests the need for encapsulation of a display system as suggested by OTA.

SAXE ET AL. Reference: SAXE ET AL. teaches of all the limitations of claims 1 and 6 with the exception of being silent as to a first and second particle mobility, column 1 lines 55-65, column 2 lines 55-56, column 3 lines 20-25, column 13 lines 40-45. SAXE ET AL. teaches of electrophoretic particles of the migrating type, column 3 lines 20-25, as an alternative embodiment for its light valves, or encapsulated electrophoretic particles, column 1 lines 55-65, column 2 lines 55-56, column 3 lines 20-25. SAXE ET AL. further teaches “two or more different pigments or other types of particles may be combined in any useful proportions to form suspensions having a vast number of different off-state colors”, column 13 lines 40-60. SAXE ET AL. further teaches of a manufacturing process for this pigment or particle dispersions, columns 5 and 6, wherein particles when known for use in electrophoretic displays are mentioned, column 6 lines 10-38, of the Inorganic pigment type known

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for use with electrophoretic displays. These particles migrate in a direction going from one electrode to the other according to an applied electric voltage across the two electrodes. **Motivation Suggestion in SAXE:** SAXE ET AL. teaches of modifying a display similar to that suggested by OTA, as shown in SAXE ET AL.'s figures 1 and 2, wherein display particles are encapsulated by conductive (electrodes) and/or non-conductive coatings. This SAXE ET AL. reference could have also been used by the Examiner as a main reference in view of OTA for an equally valid rejection wherein OTA suggests the that the two or more particles of SAXE ET AL., can have a first and second mobility, however the Examiner elected not to use this equally valid rejection.

SUMMARY:

In the broadest interpretation of the claims language, not elected by the Examiner, OTA **alone** reads on claims 1, 2, and 6, and NAOYUKI alone or SAXE alone reads on claim 6. OTA, based on the narrowest interpretation of the claims language, is silent as to the particles being capsuled. Both NAOYUKI and SAXE suggest motivation for electrophoretic displays as suggested by OTA being capsuled to improve the display performance. OTA, NAOYUKI, and SAXE all teach of electrophoretic displays of the migrating particle type as claimed. Therefore it would have been obvious to the skilled artisan at the time of the invention to modify the display as taught by OTA to include capsulized particles as taught by NAOYUKI and SAXE because it would create a uniform and stable display, enhancing the display by eliminating sticking of the particles, as found in claims 1, 2, and 6.

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The following ground(s) of rejection are applicable to the appealed claims:

Claims 1, 2, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over OTA(3756693) in view of NAOYUKI ET AL. (JP 64-86116) and SAXE ET AL. (5650872). This rejection is set forth in prior Office Action, Paper No. 20.

Claim 3-5 and 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over OTA(3756693) in view of NAOYUKI ET AL. (JP 64-86116), SAXE ET AL. (5650872), and OTA ET AL. (3870517). This rejection is set forth in prior Office Action, Paper No. 20.

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(11) Response to Argument

8.1 Claims 1, 2, and 6.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, SAXE et al is used to support motivation for modifying OTA. The Appellant arguments are directed as if the Examiner used SAXE et al. as a main reference. While SAXE alone reads on claim 6 in its entirety, and could have been used as a main reference, this is not how SAXE was utilized in the rejection. SAXE teaches of an electrophoretic display, as supported by column 2 lines 55-56 and column 3 lines 20-30 in the description of the invention section, and further as supported by the mention of the inorganic pigments, column 6 lines 10-38, known for use as electrophoretic particles dispersed in a liquid suspension medium, column 8 lines 1-16, as discussed in connection to the manufacture of the display. Within SAXE can be found all the limitation of claims 6, and regarding claim 1 SAXE is silent as to the two types of particles having differing mobilities. The Examiner totally disagrees with the statement SAXE et does not teach "encapsulating two or more species of particles", because on SAXE explicitly states he teaches of an electrophoretic display, column 2 lines 55-56, and explicitly describes the well known migrating particles of the electrophoretic display, column 3 lines 20-25, he

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further teaches how to manufacture a display such that particles of the electrophoretic type are placed in capsules, column 6 lines 10-38, column 13 lines 40-45. Therefore SAXE is well supported for its teaching of electrophoretic particles, wherein two or more types of particles, dispersed in a suspension medium, are further encapsulated. Even if the Examiner had used SAXE as a main reference the Appellants arguments would not be persuasive. SAXE is used to support motivation for modifying OTA, by encapsulating the particles of OTA.

Appellant argues OTA '693 does not mention capsulated particles or even suggest at least one capsule containing a suspending fluid and at least one particle. Not only does OTA teach of capsuling particles with the electrodes 8 and 9, as shown in figure 1a, OTA also teaches of capsulating the particles of with the substrates 3 and 5, as shown in figure 1a. Therefore the Appellants argument claiming element distinction from the electrodes, does not cover the encapsulation by the substrate.

Appellant argues NAOYUKI fails to cure the deficiencies of OTA, however the Examiner totally disagrees with this statement. As can be seen in the English Translation of NAOYUKI, NAOYUKI suggests the need for encapsulating electrophoretic displays as suggested by OTA to prevent sticking of the particles to the electrodes, page 4 paragraph 4.

The Appellant argues that SAXE teaches only anisometric particles. This statement is totally in error, as shown on column 2 lines 55-56, where SAXE explicitly teaches of an "electrophoretic display",

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and on column 3 lines 20-25, wherein SAXE explicitly teaches electrophoretic displays are of the migrating particle type as claimed.

8.2 Claims 5, 8, and 9

Appellant argues that OTA '517, OTA '693, and NAOYUKI, either alone or in proper combination, do not provide an enabling disclosure of making or using the "encapsulation" limitation of: "at least one capsule containing a suspending fluid and at least one particle, with either the mobility limitation of claim 5 or the migration limitation of claims 8 and 9. The Examiner totally disagrees with this statement. Claim 1, 2, and 6 were argued above by the Examiner as it relates to encapsulation, mobility, and migration. Further, claims 5, 8, and 9 are directed towards dyed suspending medium, particles matching electrode optical property, and having white particles. Each of these limitations can be found in OTA or SAXE. Appellant failed to mention anything about the teaching of SAXE who specifically teaches how to make and use electrophoretic displays. Claims 5, 8, and 9 have been rejected in view of OTA (693 & 517), NAOYUKI, and SAXE. The motivation for combining these references are the same as applied to claims 1, 2, and 6. Further, they all represent well known electrophoretic display systems that contain particles within a suspension medium, contained within a capsule, said particles migrating from one electrode to the other, according to the applied electric voltage. They all discuss displaying varied colors, which as well known, requires varying the appropriate colors of the electrodes, suspending medium, and particles, to produce a resultant colored image. Therefore it would be obvious to the skilled artisan to use any combination of colored

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display elements, as suggested by OTA (693 & 517), NAOYUKI, and SAXE, to achieve a colored display, because such combinations are well known for use in electrophoretic display systems.

As in claim 5, OTA teaches wherein the suspending medium being dyed, OTA (517) column 7 lines 15-25, column 10-43-53. **As in claim 8**, SAXE teaches wherein said at least one particle has an optical property matching an optical property of one of said at least two electrodes, SAXE column 5 lines 7-15, column 6 lines 10-35, wherein the rear electrode is colored white, and the inorganic pigment and oxide used as an electrophoretic particle, titanium, is known and used for its white particle color. **As in claim 9**, OTA teaches wherein said at least one particle is substantially white, OTA (517) column 9 lines 1-5, figure 3a item 15, OTA (693), column 2 lines 52-58. NAOYUKI teaches of encapsulating the disperse systems in microcapsules in advance, making it possible to produce disperse systems with various display colors, page 4 paragraph 6.

As shown above, OTA (693 & 517), NAOYUKI, and SAXE, suggest or teach of all the limitations found in claims 5, 8, and 9. Said limitations are well known in for the purpose of producing a colored display as suggested in OTA (693 & 517), NAOYUKI, and SAXE.

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8.3 Claim 3

The Appellants argument regarding OTA(517) not teaching the combination of blue, green, and red particles in a capsule is **correct**, however OTA is used in combination with SAXE, OTA(693), and NAOYUKI to suggest such a combination would have been obvious design choice given OTA's(517) suggestion of three particle colors in combination, and SAXE's suggestion, wherein two or more types of particles may be combined in a useful proportion to form a suspension having a vast number of different off-state colors. Changing the particle from cyan, magenta, and yellow, to blue, green, and red, would have been an obvious design choice given the need to produce a color display as suggested by OTA (693 & 517), NAOYUKI, and SAXE.

SAXE teaches of a number of particle colors including blue and green, column 6 lines 50-63, column 2 lines 43-51, and further teaches that two or more types of particles may be combined in any useful proportions to form suspensions having a vast number of different off-state colors, column 13 lines 40-45. NAOYUKI teaches of encapsulating the disperse systems in microcapsules in advance, making it possible to produce disperse systems with various display colors, page 4 paragraph 6. OTA (693) teaches of particles in a suspending medium having a green color, column 3 lines 10-25, and also red pigment particles, column 3 lines 35-40. OTA (517) teaches of at least three kinds of photosensitive electrophoretic particles, the colors of which are cyan, magenta and yellow, respectively, and have photosensitive responses to red, green and blue light, respectively. Given the above know particles colors acting in combination to form a display, it would be obvious to the skill

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artisan, make the design choice of picking a combination of colors, in particular the well known primary colors of blue, green, and red, to form a display system as suggested by SAXE, wherein two or more types of particles may be combined in a useful proportion to form a suspension having a vast number of different off-state colors, as found in claim 3. Changing the particle from cyan, magenta, and yellow, to blue, green, and red, would have been an obvious design choice given the need to produce a color display as suggested by OTA (693 & 517), NAOYUKI, and SAXE.

8.4 Claims 4 and 7

Appellant argues that OTA(517) teaches away from the suspending fluid being substantially transparent. The Examiner disagrees with the Appellant for the following reasons. As in claims 4 and 7, OTA (517) teaches wherein the suspending fluid is substantially transparent, column 4 lines 19-22. OTA teaches of the suspending medium being colorless in the context of explaining how the resultant image is produced from the combination of the electrophoretic particle, electrodes, and suspending medium. OTA states the particle 6 and the suspending medium both act as the colorant in the reproduced image, and if the suspending medium is colorless, both of the areas subjected to black light or white light will have the same color, that is, a black color, at both electrodes. When OTA suggests a colorless suspending medium, he is equivalently suggesting a transparent suspending medium that allows the particle or electrode color to be seen through the transparent suspending medium. Appellant argues that OTA(517) teaches away from the suspending fluid being substantially transparent, but OTA's teaching of colorless is used to mean transparent. The Appellant suggests

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that a colorless suspending medium will not work, however given an applied voltage to the display electrodes, the particles will still migrate from one electrode to the other, allowing a high and low contrasted image to be formed, as with all like functional electrophoretic displays. With the colorless suspending fluid the particles still migrate from the back electrode to the forward electrode and the high/low contrast is still maintained. Therefore any suggesting that such a system is inoperable is a gross mis-statement of the facts. Further, given the ingredients of the suspending medium as suggested by OTA and SAXE, unless a colored dye is used to effect the display contrast, such a white or red, the normal color for the suspending medium fluid is typically transparent.

8.5 SUMMARY

In summary the Appellant has argued that the references OTA (693 & 517), NAOYUKI, and SAXE either alone or in proper combination fail to teach the claimed invention. In a broad interpretation of the claims OTA (693 & 517), NAOYUKI, and SAXE, all used alone anticipates the claimed invention as found in claim 6. In the broadest interpretation of the claims language, not elected by the Examiner, OTA(693) **alone** reads on claims 1, 2, and 6, and NAOYUKI alone or SAXE alone reads on claim 6. OTA, based on the narrowest interpretation of the claims language, is silent as to the particles being capsuled. Both NAOYUKI and SAXE suggest motivation for electrophoretic displays as suggested by OTA being capsuled to improve the display performance by preventing the particles from sticking to the electrodes. OTA, NAOYUKI, and SAXE all teach of electrophoretic displays of the migrating particle type as claimed. Therefore it would have been obvious to the skilled

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artisan at the time of the invention to modify the display as taught by OTA(693) to include capsulized particles as taught by NAOYUKI and SAXE because it would create a uniform and stable display, enhancing the display by eliminating sticking of the particles to the electrodes, as found in claims 1, 2, and 6. Further claims 3-5 and 7-9 are obvious over in OTA (693 & 517), NAOYUKI, and SAXE in proper combination as detailed above.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

David L. Lewis

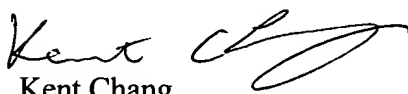
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